National Weather Service Spring Flood Outlook (NWS Hastings Coverage Area)

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February 11, 2021

Short Term Outlook

Short Term Outlook: February 11th - March 7th

- **South Central Nebraska:** There is an **Above normal risk** for ice jam and snow melt flooding until the snow has melted and the ice is off of our rivers (Possibly 1st Week of March). This is due to the following factors:
  - *Around 2 inches of liquid currently contained within our local snowpack*
  - *Thickening river ice and frost depth that will at least be near normal to perhaps even a little above normal by the end of February.*

- **North Central Kansas:** There is a **Below normal to near normal risk** for Flooding from snow melt.
  - The snow depth over Kansas is less significant than across southern Nebraska and does not have as much moisture within it.

Long Term Outlook

Long Term Outlook: March 7th (or after river ice-out) through May 14th

- **<u>South Central Nebraska and North Central Kansas:</u>**

  There is a **<u>Below normal risk</u>** for spring flooding. This is due to the following factors:

  - *Dry soil moisture conditions.*
  - *Long term climate forecast hedging towards drier than normal*

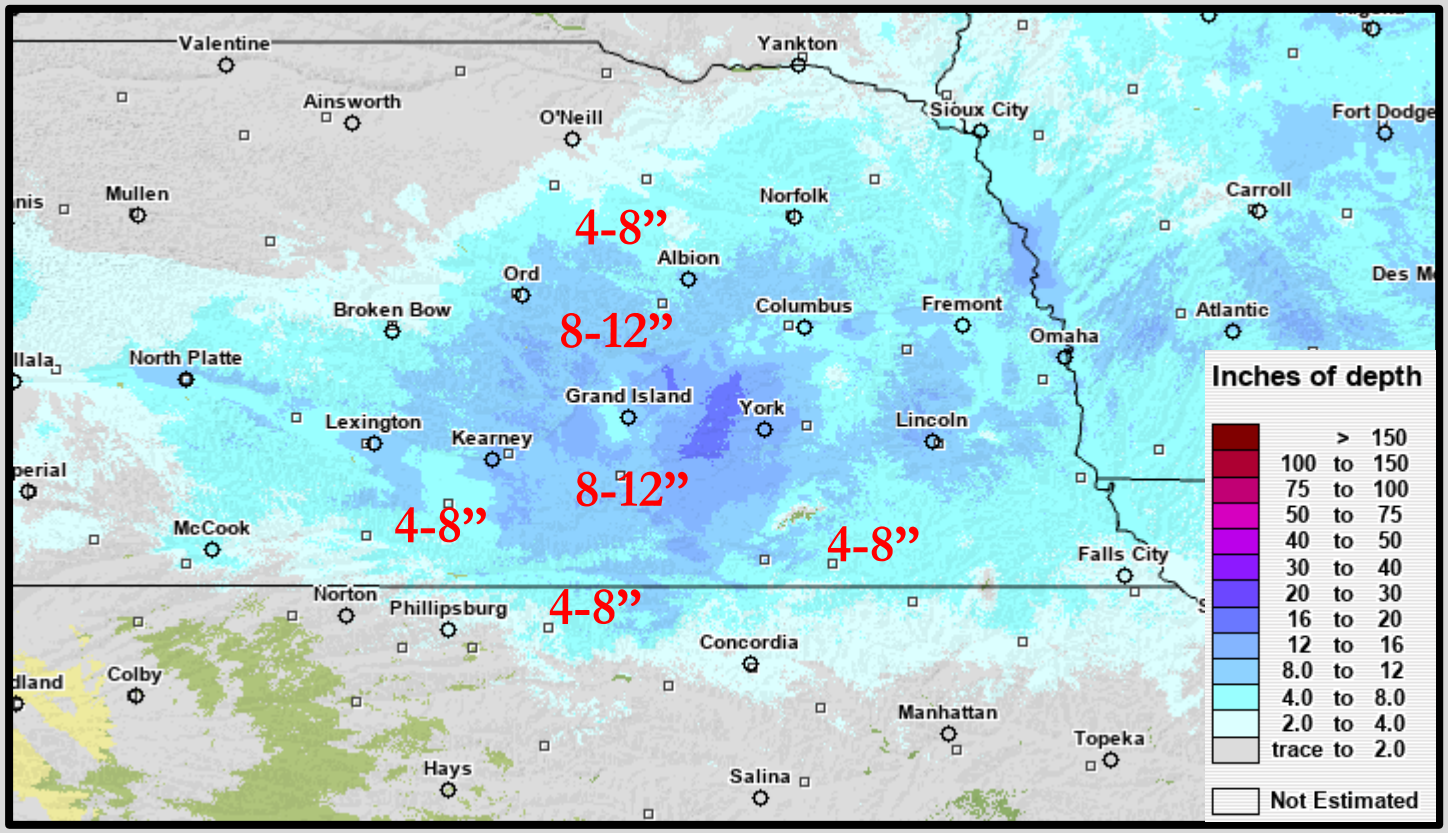
Spring Flood Outlook Factors

As of February 11th

Flood Risk Contribution Factor	Contribution to Flood Risk
Snowpack (South Central Nebraska)	Above-Normal Risk
Snowpack (North Central Kansas)	Normal Risk
Snowpack (Mountains)	Below-Normal Risk
Soil Moisture	Below-Normal Risk
Streamflow	Normal Risk
Precipitation Outlook	Below-Normal Risk
Frost Depth/River Ice	Normal to Slightly Above Risk

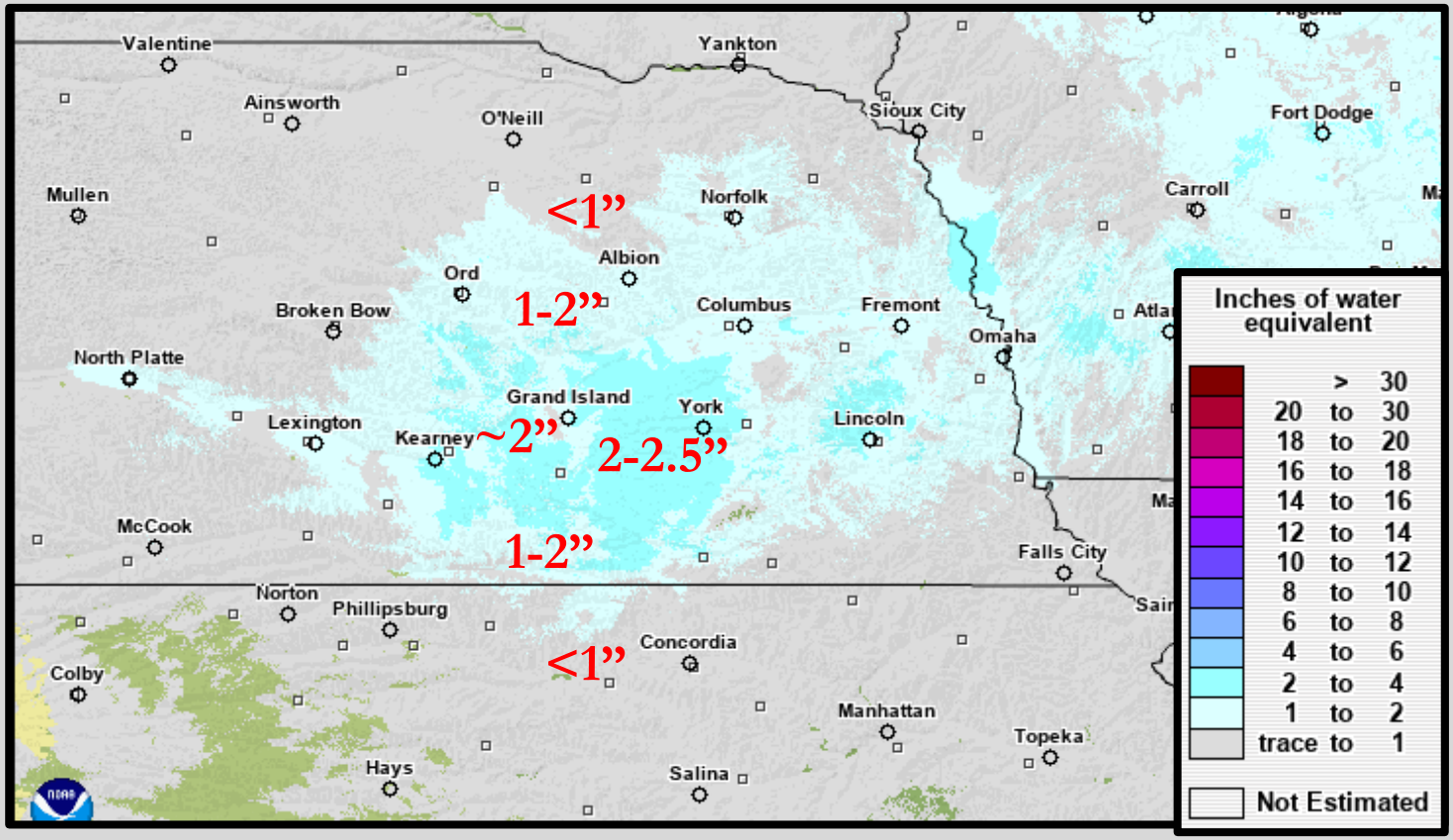
The following slides provide additional details for each flood risk factor

Plains Snowpack
as of February 11, 2021



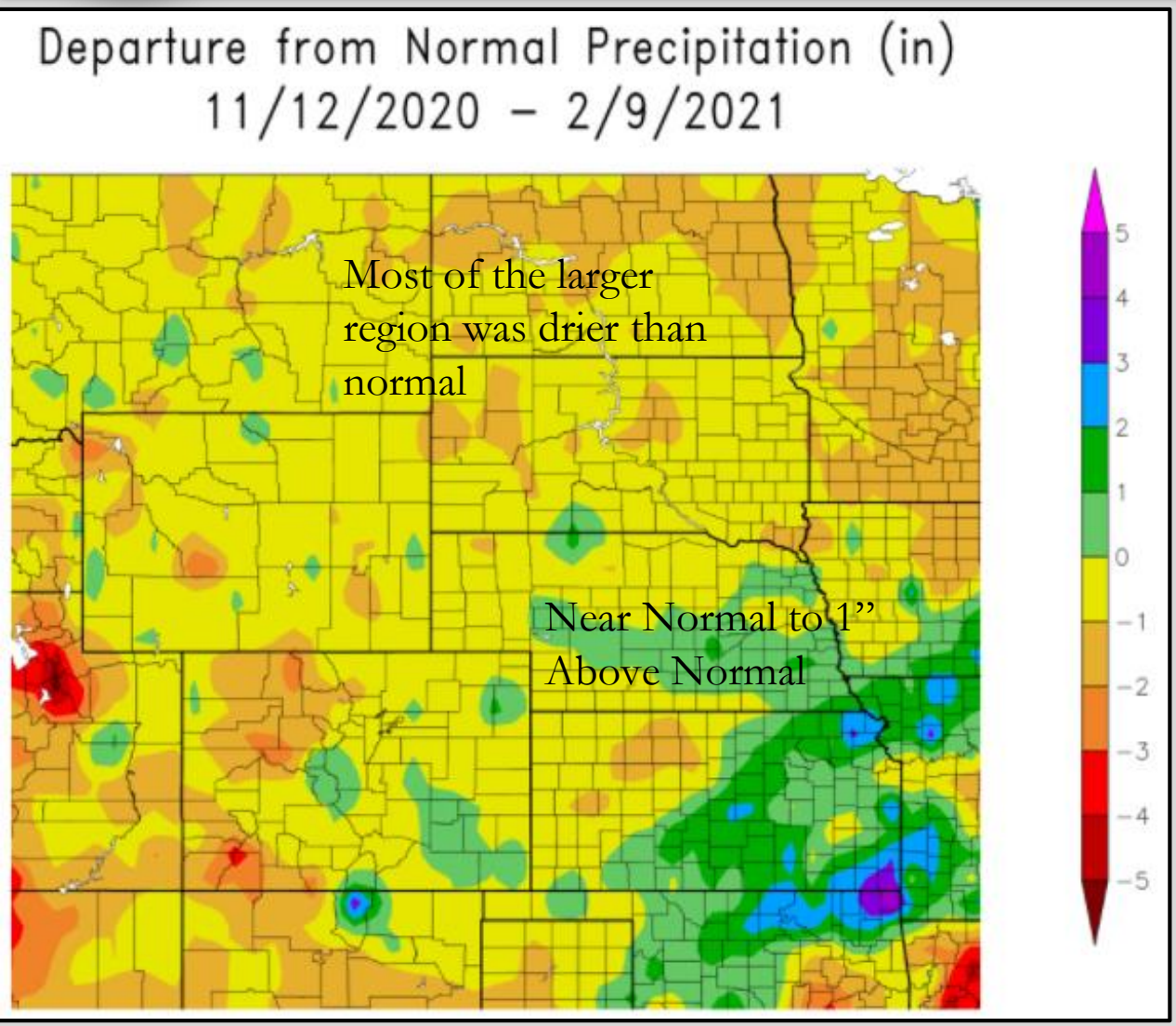
Deep snowpack will enhance flooding threat in the short term until it has melted. A slow snow melt will be easy for our drought stricken ground to absorb. However, a rapid snow melt could result in some minor flooding.

Liquid Water Equivalent
as of February 11, 2021



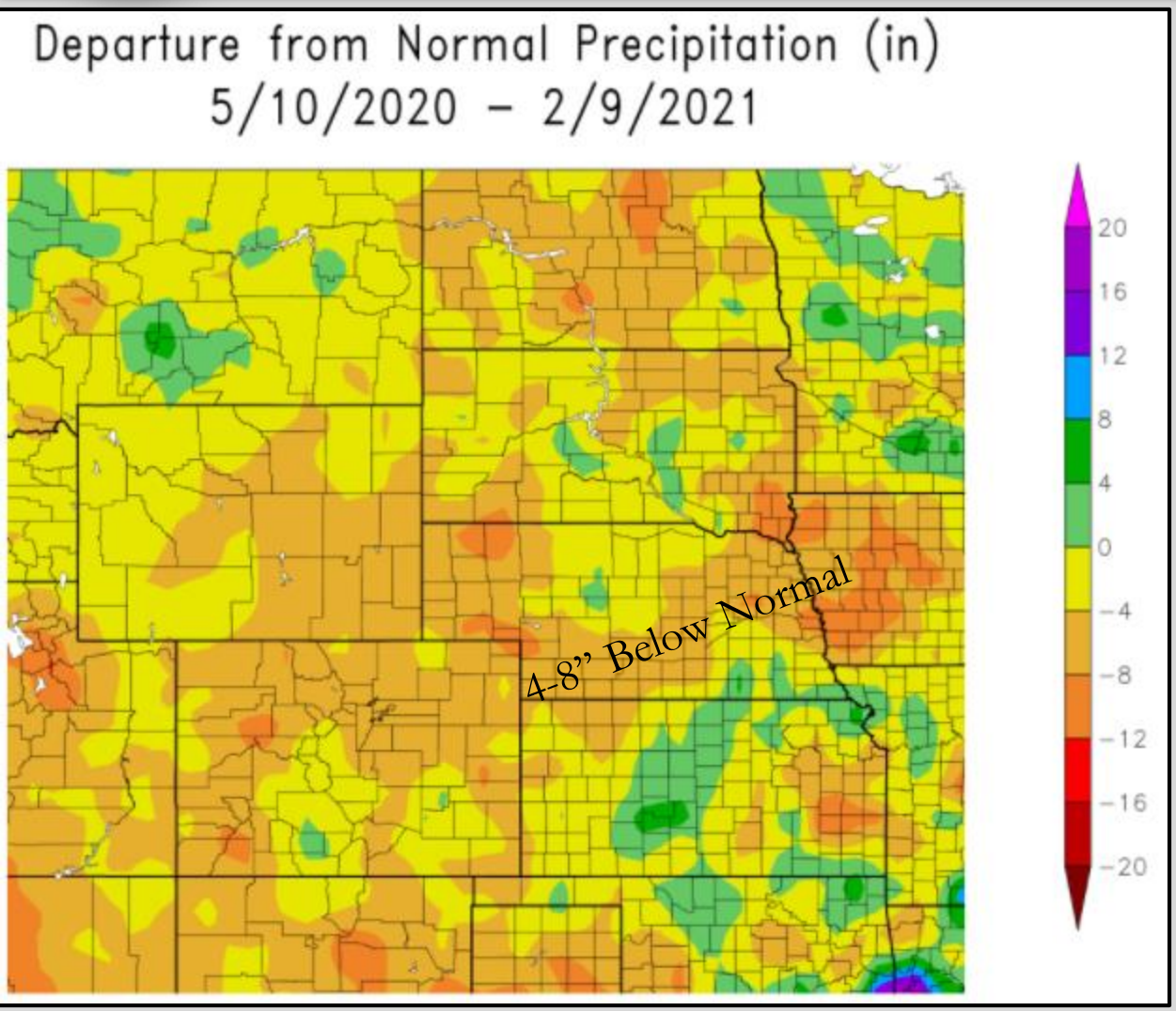
A rather deep snowpack along I-80 in central Nebraska will melt down to around 2 to 2.5 inches of liquid. The hope is that this snow will melt slowly and recharge our drought stricken ground. However, if the snow melt is too rapid then there will be an enhanced flood risk with increased runoff.

Last 3 Months Precipitation (Near to Slightly Above Normal)



- **Heavy snows along I-80 corridor from late January through early February have pushed our 3 month precipitation totals to above normal locally.**
- **However, big picture for the larger region indicates that most surrounding states especially to our north and west were drier than normal.**

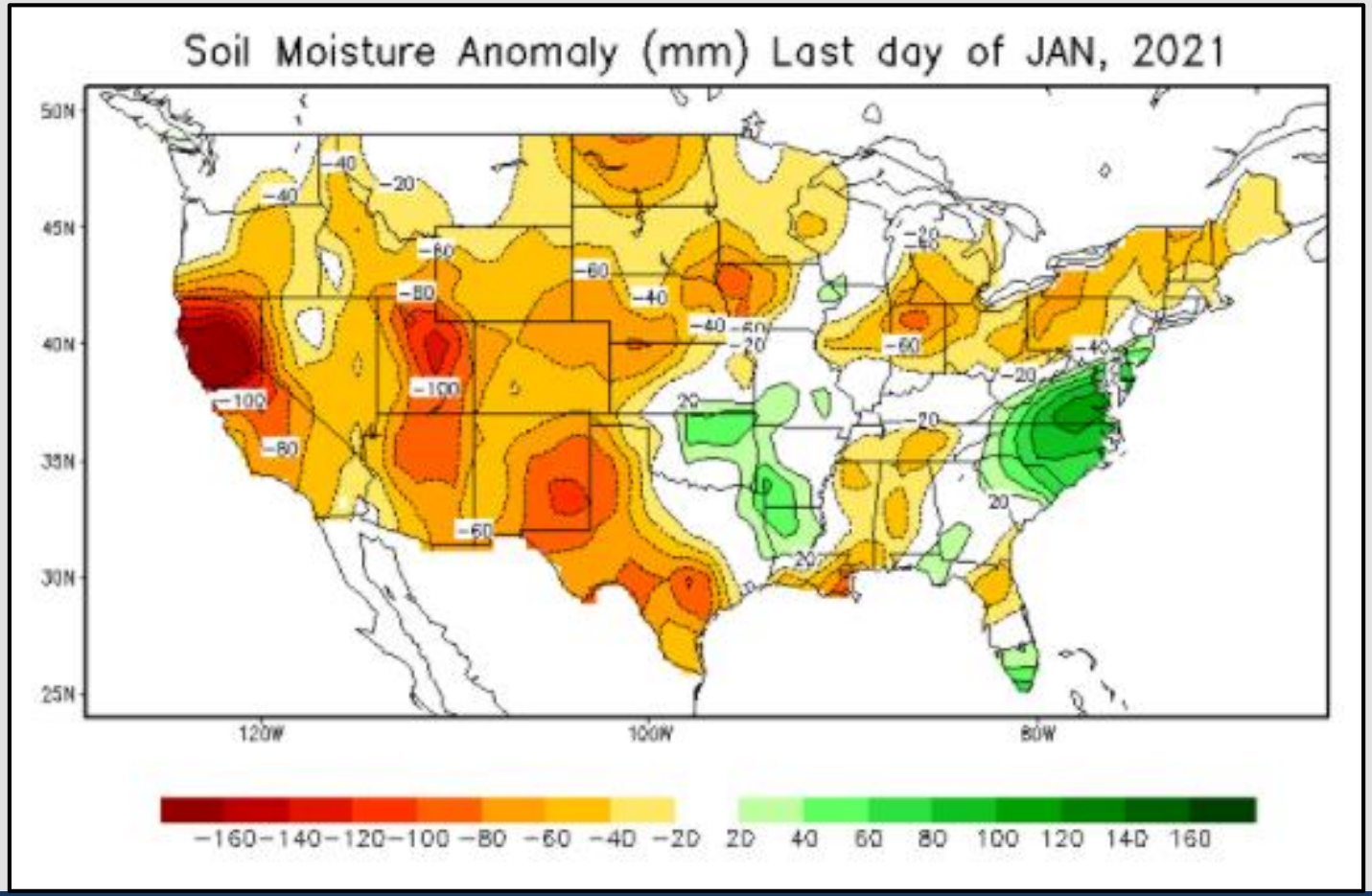
Last 9 Months Precipitation (Well Below Normal)



- Although we have been wet/snowy lately. It only puts a very small dent into what is still a 4-8" moisture deficit that exists across much of our area over the longer 9 month period.

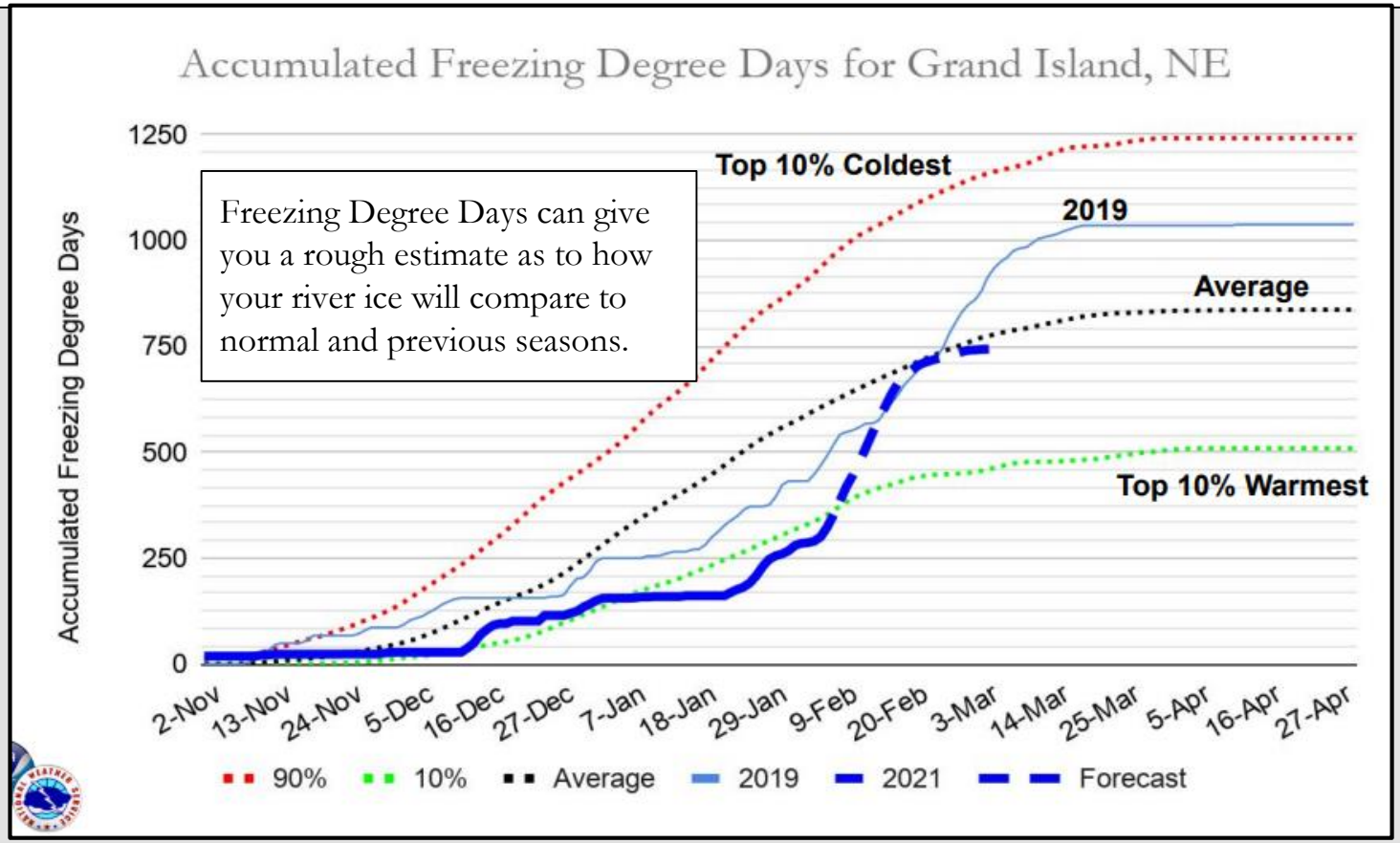
Soil Moisture (Below Normal)

Soil moisture values have been very low and certainly drier than normal thanks to our summer of drought. This soil will be able to absorb a good deal of moisture.



River Ice Thickness (Near Normal)

The November - January 15th period was the warmest on record in the Tri-Cities area. Consequently, there was little to no river ice through mid January. However, the current week to 10 days will be the coldest since 1983 and we expect at least an average season's worth of river ice to form and be in place by about February 25th.

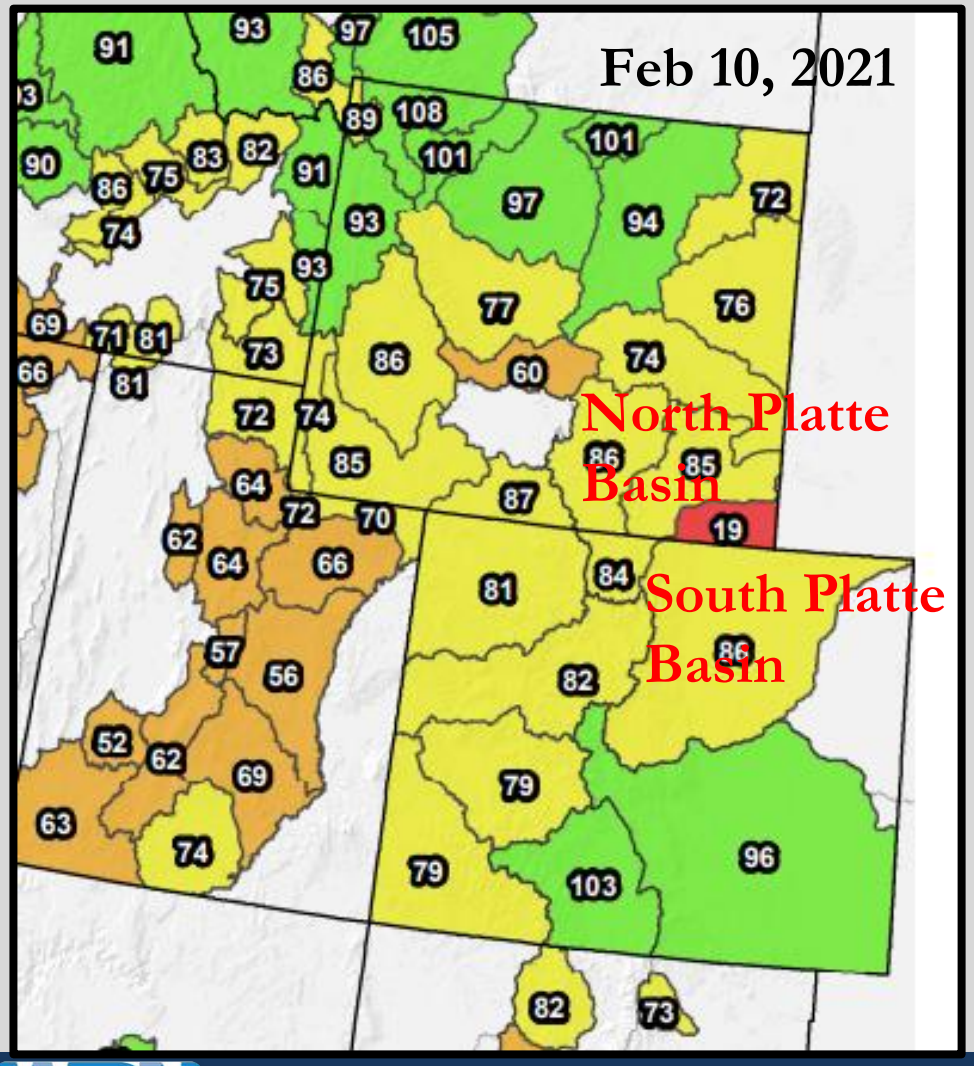


Hastings Frost Depth

- Frost Depth of 13” measured on Feb 11, 2021
- Max Frost Depth in February 2020 was 9”
- Max Frost Depth in February 2019 was 21”
- Max Frost Depth in February 2018 was 17”
- Given expected cold weather we should see frost depth continue to increase and likely make it into the 17-20” range by February 25th.
- It is not untypical to see frost depths of 15-20”. The key is simply that we need to thaw the ground before we get any appreciable spring rainfall. The soil is dry and will easily absorb much of this moisture as it thaws and the snow melts.
- However, we will have to keep a close eye out for any rain storms that develop prior to the ground thawing. Any appreciable rain on frozen ground will lead to an enhanced flooding risk.

Mountain Snowpack (Feeds Platte River)

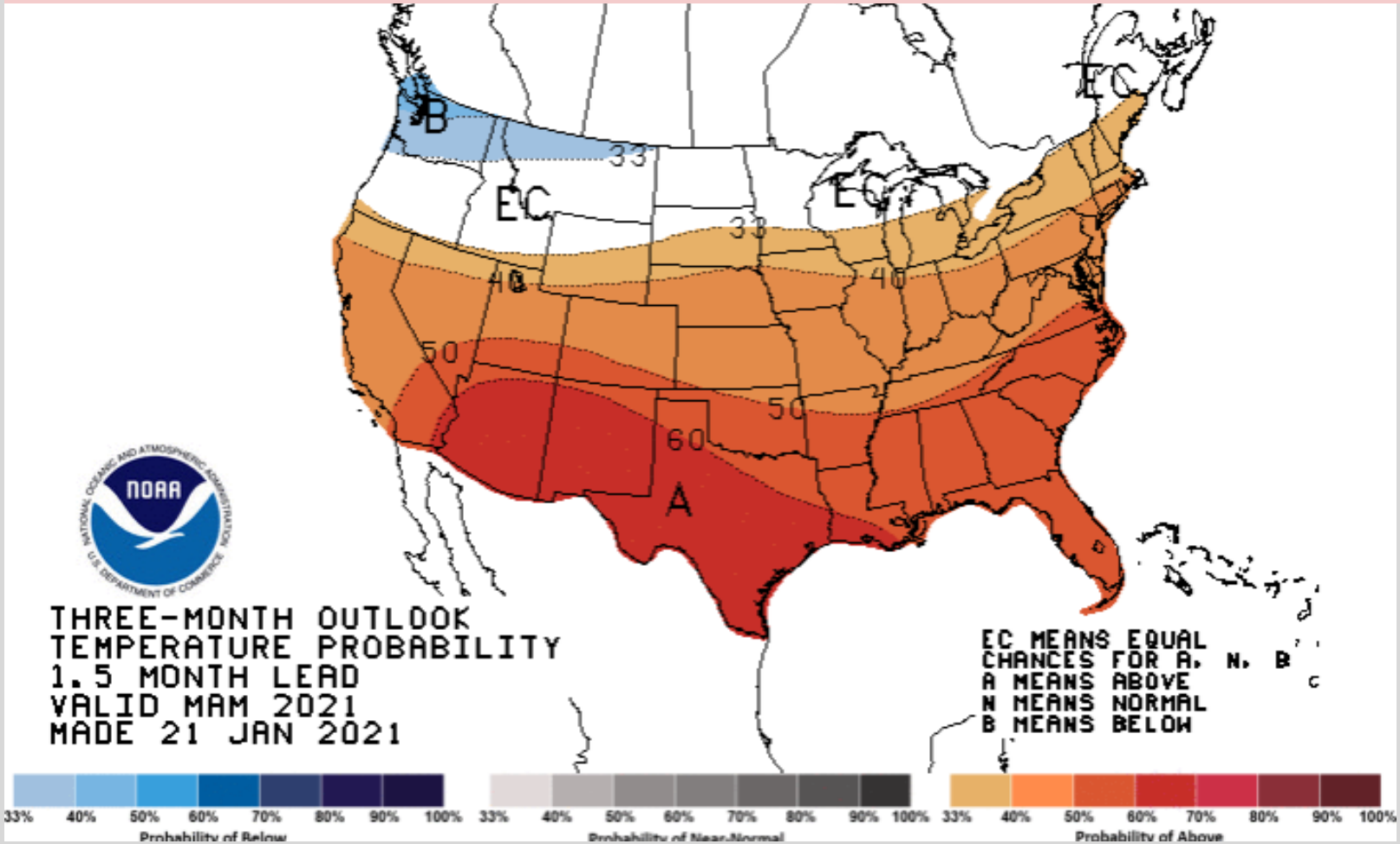
SNOTEL Current Snow Water Equivalent % of Normal



- The snow water equivalent within the North Platte River Basin of southeastern Wyoming is below normal for this time of year.
- The snow water equivalent within the South Platte River Basin of northeastern Colorado is below normal for this time of year.
- Consequently, the Platte River inflows due to mountain snowpack will likely be below normal to perhaps near normal at best.

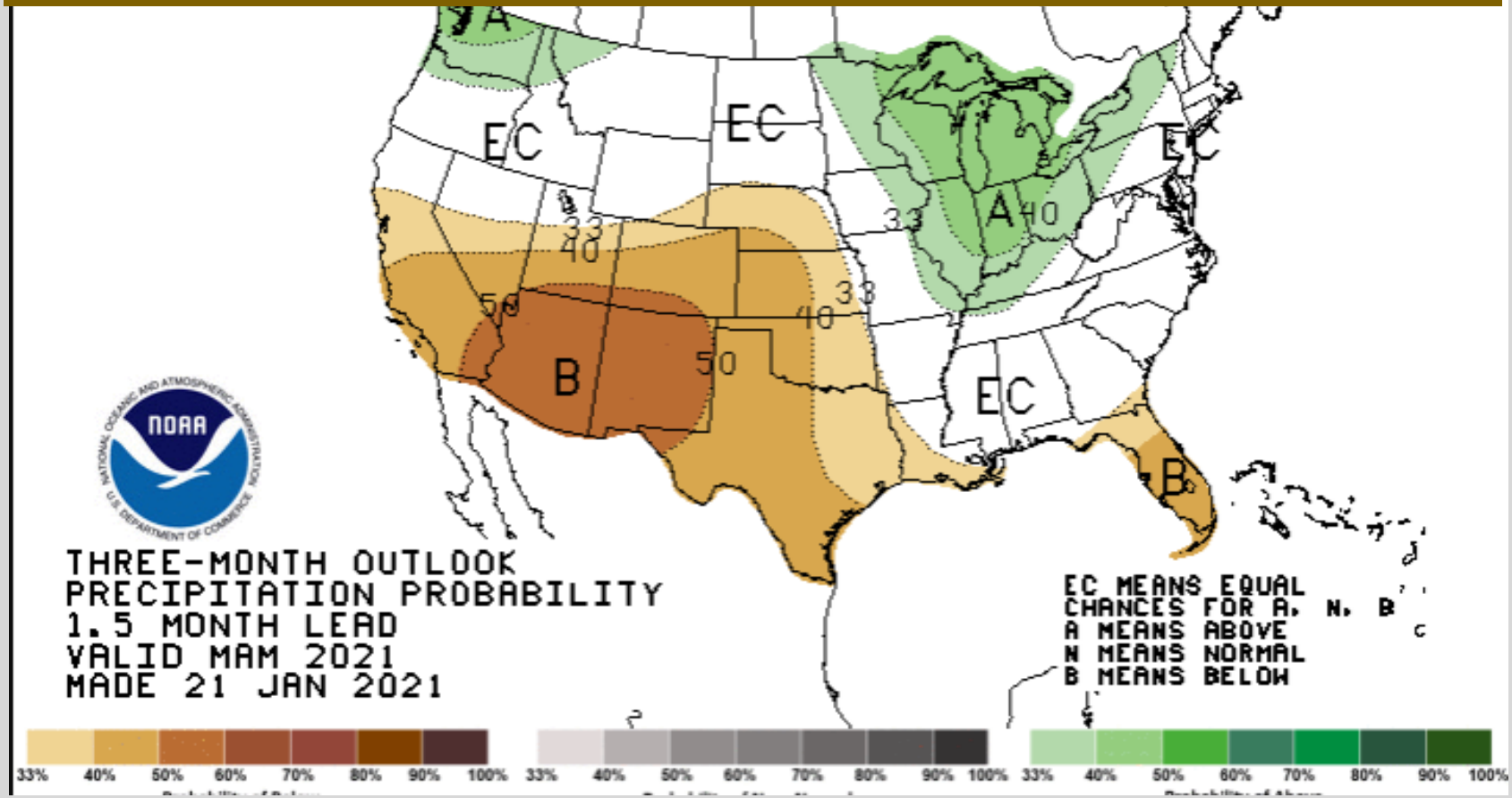
Long Range Temperature Outlook

We are more likely to see overall warmer than normal conditions March-May



Long Range Precipitation Outlook

We are more likely to see overall drier than normal conditions March-May



Summary

- **Overall flood risk this spring:**
  - Initially above normal across south central Nebraska until the snow and ice are gone.
  - Initially near normal to below normal across north central Kansas where snow depth is less significant.
  - Overall the longer term flood risk will be below normal for most areas due to the dry soils and below normal long term precipitation outlook. However, even in dry periods localized flooding events do occur.

National Weather Service
Spring Flood Outlook

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